



Common protocols and tools for characterisation and evaluation of *Malus/* *Pyrus* genetic resources – an ECPGR project.

Marc Lateur, Matthew Ordidge, Monika Höffer & Charles-Eric Durel



What is ECPGR ?

ECPGR is a collaborative Programme among most European countries, aiming at ensuring the long-term conservation and facilitating the utilization of plant genetic resources in Europe.

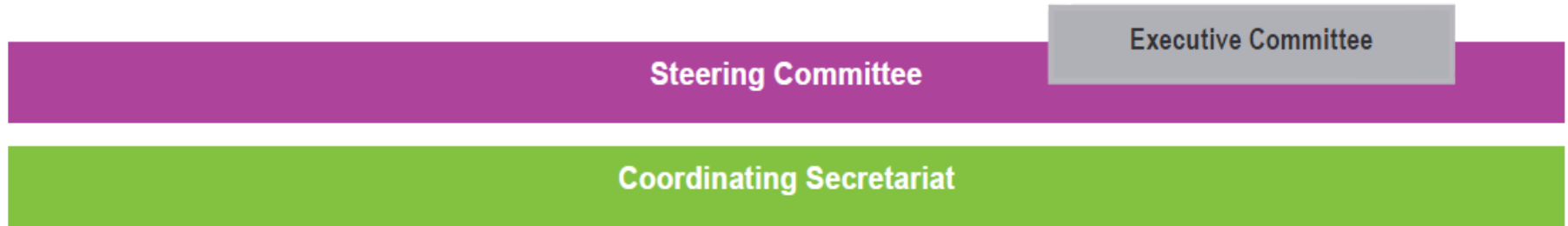
www.ecpgr.cgiar.org/

Phase IX (2014-2018)

- Annual budget ca. € 520k from 38 countries
- Letters of Agreement signed by 33 countries



Structure



— Crop Working Groups —

18

— Thematic Working Groups —

- *Allium*
- *Avena*
- Barley
- *Beta*
- *Brassica*
- Cucurbits
- Fibre Crops (Flax and Hemp)
- Forages
- Grain Legumes

- Leafy Vegetables
- *Malus/Pyrus*
- Medicinal and Aromatic Plants
- Potato
- *Prunus*
- Solanaceae
- Umbellifer Crops
- *Vitis*
- Wheat

- Wild Species Conservation in Genetic Reserves
- On-farm Conservation and Management
- Documentation and Information

Project submitted to ECPGR ‘Grant scheme’ process for developing common protocols and tools for characterisation and evaluation of *Malus/ Pyrus* genetic resources (24 months – budget = 30.000 €)

Objective 1 : To finalize and edit in electronic format “ECPGR methods and descriptor lists for the Characterization and Evaluation of apple & pear genetic resources” documents.

Context:

- Many descriptors for different users and goals
- Need to define common protocols and methods
- Need to enlarge the list of reference cultivars adapted to main European climates
- Need to create specific EVALUATION descriptors & priorities



European Union
Community Plant Variety Office

CPVO-TP142 Final
English
Date: 14/03/2006

PROTOCOL FOR DISTINCTNESS, UNIFORMITY AND STABILITY TESTS

Malus domestica Borkh.

APPLE

UPOV Species Code: MALUS_DOM

Adopted on 14/03/2006

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Lidgerikschter Volksrechtlicher
Hochschuler EVO
Forschungsinstitut
Agronomic Change-Management AGRI

FRUCTUS
Ein Netzwerk zur Förderung des Obstbaus
L'association pour le développement des pommes de France

Obst-Deskriptoren NAP Descripteurs de fruits PAN

Financial support provided by the Federal Office for Agriculture (BLW)

Vielheit in der Landwirtschaft
AKTION PFLANZEN
Ein Programm
des Bundesamtes für Landwirtschaft

Common protocols and tools for characterisation and evaluation of Malus/ Pyrus genetic resources – an ECPGR project.



Priority Characterization and Evaluation Descriptors for *Pyrus communis*

Methods and descriptor lists
for the Characterization and Evaluation
of pear diversity

PEAR
(*Pyrus communis*)

M. Lateur, D. Szalatnay

Draft Version
March 2017



ECPGR methods and descriptor lists for characterization
and evaluation of apple genetic resources

APPLE
(*Malus x domestica*)

M. Lateur, D. Szalatnay, E. Dapena,.....

Draft Version - 12 April 2017

Objective 2 : To harmonize SSR's data across already genotyped collections of European pear in order to make them available for users and EURISCO.

Context:

- Many papers and work available for characterisation of apple & Pear genetic resources with SSR's markers
- Although ECPGR common protocols and referenc cvs are defined...
- Data from different institutes are not comparable!
- Need to standardize and harmonize data!



Bronzée d'Enghien - BEL

Synonym: 'Bronzierte von Enghien' (LUC-etal1).

Origin: Old Belgian pear raised around 1830, first published by « Société Van Mons » but seems to be gained by M. Paternoster, small trader from the Enghien town in Wallony. Since 2015, this cultivar has been selected by the « Centre Wallon de Recherches Agronomiques » to be released for the nursery market under the label RGF-Gbix - CERTIFRUIT.



Fruit description: Size medium to small in relation with tree yield (40-55 mm). Shape like an elongated drop. Skin thick*: green as ground color and nearly completely over coated by brown russet. Three to five fruits are very often hanging as a cluster*. Stalk quite long, thick, straight inserted in a quite wide shallow cavity*. Eye irregular, closed or half open, long converged sepals quite thick at base* in a medium to shallow cavity. Flesh quality medium fine to coarse, core surrounded by grit cells, good cooking fruit since half October to end November, becomes then juicy and melting with an acidic and very light astringent taste up to January. Harvest period: late – mid-October.

Tree description: Vigor: good, easy tree to train in central leader or pyramid bushes; good compatibility with Quince for dwarfed bushes or espaliers and well adapted on seedling rootstocks for raising standard trees. Fertility: early in production and very good cropping trees. Pollination: flowering in medium season, very good pollinator.

Disease susceptibility: Hardy and robust cultivar, very low susceptible to scab on fruit, leaves and twigs.

Traditional uses and advices from own experiences: Good late autumn and early winter pear, very robust, quick and reliable fertility, well adapted in cold regions. Both used as good cooking pear during the first month after picking and later on as juicy rather acidic dessert pear. The cultivar has a very positive trait to be fairly not susceptible to fruit drop near harvest maturity period – even after leaves fall, majority of fruits stays hanging on the tree – therefore the cultivar was formerly often used in grazed standard tree orchards.



*=Typical distinguish trait for the cultivar.

Reference pomological description: VCA5, p.28 : Van Cauwenbergh E (1949). Pomologie, Tome 2, Cours d'arboriculture fruitière, Poires. Ecole d'Horticulture de l'Etat, Vilvorde, pp. 61.

Author: Marc LATEUR (Wallon Agricultural Research Centre-CRA-W)

1)

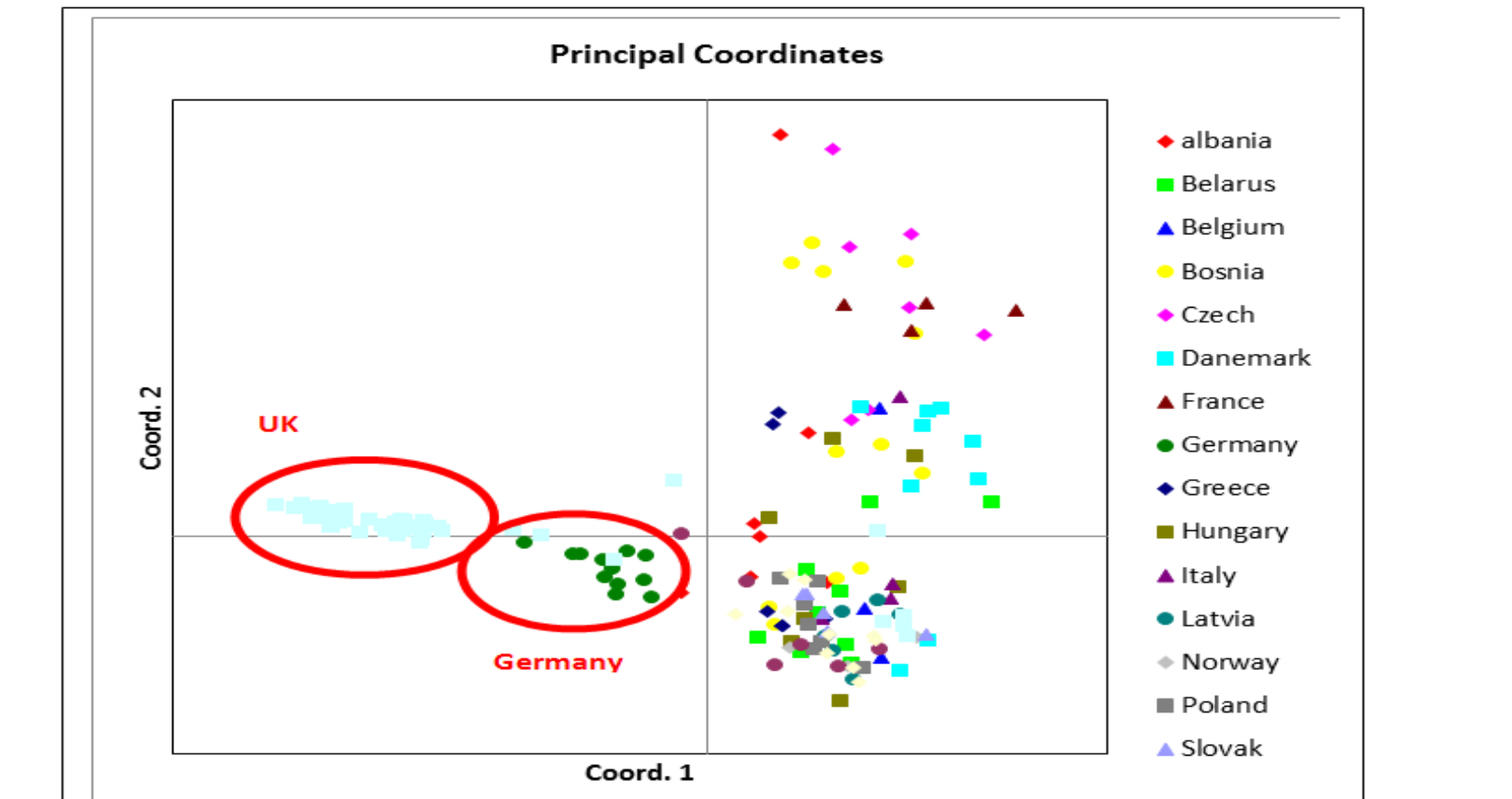
- 17 collectio
- 140 pear a
- E & C prio
- Standard r
description

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3. Problems with merging data from different analyses

- We tried to merge the Ecohispy data detailed above with data originating from a UK analysis (Brogdale) and from a German analysis.

A PCoA analysis conducted with GenALEx, v 6.2 highlighted problems with the merging of the data (figure 3): the UK and German data formed two very distinct clusters and such a clustering is obviously not related to genetic differences.



Many partners:

Partner ID No.	Name and Surname	Institute	Country
Objective 1			
1	Guyader Arnaud (apple & pear)	INRA/Agrocampus-ouest/Université d'Angers) Centre Angers-Nantes	France
2	Höfer Monika (Co-coordinator pear descriptors - apple & pear)	Julius Kühn-Institute, Institute for Breeding Research on Fruit Crops	Germany
4	Bergamaschi Mauro (apple & pear)	CRA-RRF Unità di Ricerca per la Frutticoltura, Forlì	Italy
5	Lateur Marc (Coordinator of the project and of Objective 1 - apple & pear)	Centre Wallon de Recherches Agronomiques (CRA-W), Gembloux	Belgium
6	Kaldmäe Hedi/ Volens Kristine (Apple)	Estonian University of Life Sciences, Polli Horticultural Research Centre	Estonia
7	Røen Dag (apple & pear)	Nias næringsutvikling AS	Norway
8	Ordidge Matthew (Co-coordinator apple descriptors - apple & pear)	University of Reading	UK
9	Kajkut Zeljković Mirela (apple & pear)	University of Banja Luka, Genetic Resources Institute	Bosnia and Herzegovina
10	Sotiropoulos Thomas (pear)	Agricultural Research Centre of Northern Greece, Pomology Institute	Greece
11	Paprštejn František (apple & pear)	Výzkumný a šlechtitelský ústav ovocnářský Holovousy s.r.o.	Czech Republic
Objective 2			
12	Kellerhals Markus	Agroscope, Wädenswil	Switzerland
1	Durel Charles-Eric (Coordinator of Objective2) - Denancé Caroline	INRA/Agrocampus-ouest/Université d'Angers) Centre Angers-Nantes	France
2	Flachkowsky Henryk	Julius Kühn-Institute, Institute for Breeding Research on Fruit Crops	Germany
3	Gunars Lacis + Objective 1 (Apple)	Latvia State Institute of Fruit-Growing, Dobbele	Latvia
5	Mingeot Dominique / Lateur Marc	Centre Wallon de Recherches Agronomiques (CRA-W), Gembloux	Belgium
8	Ordidge Matthew (Co-coordinator of Objective 2)	University of Reading	UK

Partner No.	Name and Surname	Institute	Country
13	Inger Hjalmarsson – Objective 1 (apple & pear) and Gustavsson Larisa – Objective 2	Swedish University of Agricultural Sciences (SLU), Alnarp	Sweden
14	Ms Ildikó Király/Mr Zsolt Szani – Objective 1 (Corresponding partners) (apple & pear)	Kecskemét College	Hungary
15	Nikola Mlčić – Objective 1 (apple & pear)	University of Banja Luka, Faculty of Agriculture	Bosnia and Herzegovina
16	Gordana Đurić – Objective 1 (apple & pear)	University of Banja Luka, Genetic Resources Institute	Bosnia and Herzegovina
17	Kruczyńska Dorota – Objective 1 (apple & pear)	Research Institute of Horticulture, Skierniewice	Poland
18	Dapena De La Fuente Enrique – Objective 1 (Apple)	Programa de Investigación de Fruticultura, Área de Cultivos Hortofrutícolas y forestales, SERIDA	Spain
19	Jorge Urrestarazu Vidart - Objective 2	Universidad Pública de Navarra	Spain
20	Carlos Miranda Jiménez – Objective 1 (apple & pear)	Universidad Pública de Navarra	Spain
21	Carka Frida – Objective 1 (pear)	Agricultural University of Tirana, Gene Bank of Albania	Albania
22	Gregor Osterc – Objective 1 (apple & pear)	University of Ljubljana, Biotechnical Faculty	Slovenia

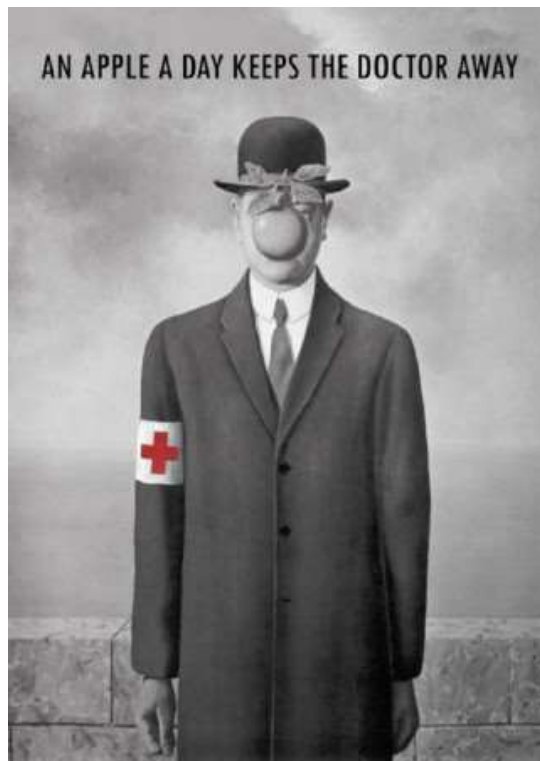
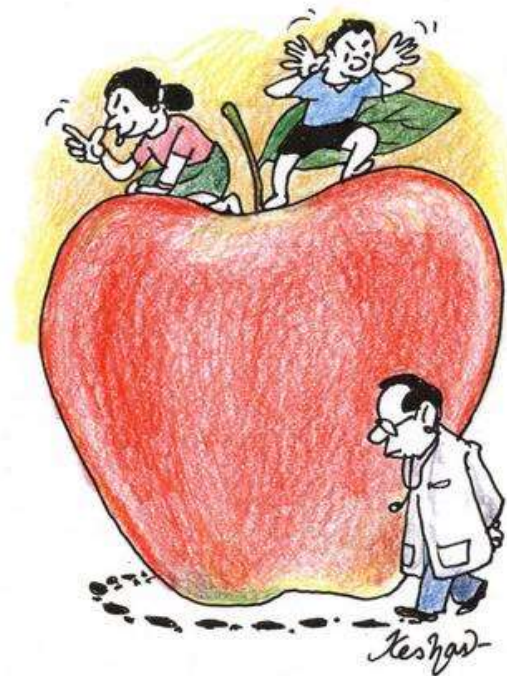
DELIVERABLES (2019)

OUTCOME 1 – Descriptors are officially adopted by WG and being implemented for collecting C & E data and available for wider potential user's communities – Results are communicated to the scientific community.

OUTCOME 2 - Harmonized set of SSR marker data of apple (>8.000 accessions) and pear (>700 accessions) genetic resources are stored in a database and offered in open access on ECPGR website and encoded in EURISCO

OUTCOME 3 - Defining putative accession denomination errors, synonyms/homonyms situations and question marks.

OUTCOME 4 – Developing genetic diversity studies at the European Level & 'core collections'.



Thank you for your attention!

